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EXAMINER

CHANG, EDITH M

ART UNIT PAPER NUMBER

2637

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. K 09/604,930	Applicant(s) ONO, SHIGERU	
	Examiner Edith M Chang	Art Unit 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☒ Claim(s) 15-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see pages 5-6, filed July 13, 2004, with respect to claims 15 and 18 have been fully considered and are persuasive. The rejections of claims 15, 18 and 21 have been withdrawn.

Applicant's arguments filed July 13, 2004 have been fully considered but they are not persuasive. The rejections of claims 1-14 are upheld.

Claims 1 and 8, Applicant argues that the reference Shiue et al. is not in any way directed to a CDMA system.

The Shiue et al. is a wireless multi-line spread spectrum system stated in column 3 lines 34-40 and column 4 lines 55-60; and in FIG.3A teaches the transceiver deploying the PN code for the code division multiple access.

The recitation code division multiple access or CDMA has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Drawings

2. The drawings are objected to because in Figure 7, the block of BUFFER MEMORY does not have a numeral number associated and does not show the control as described in specification page 41 lines 7-10.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 15-21 are objected to because of the following informalities:

Claim 15, line 7: “comprising” is suggested changing to “comprising steps of”; and line 18: “addition” is suggested changing to “summing”.

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Claim 16, line 2: "comprising" is suggested changing to "comprising steps of"; line 5: "estimation" is suggested changing to "estimating"; line 7: "the received" is suggested changing to "a received".

Claim 17, line 2: "comprising" is suggested changing to "comprising steps of"; line 5: "modulation" is suggested changing to "demodulation"; lines 10-11: "complex vector expressions" is suggested changing to "the complex vector expression"; line 12: "signals" is suggested changing to "symbols".

Claim 18, line 16: "demodulating" is suggested changing to "modulating"; and line 22: "the symbol section" is suggested changing to "a symbol section".

Claim 19, line 5: "the symbols" is suggested changing to "the pilot symbols"; line 7: "demodulator" is suggested changing to "inverse modulating units"; line 8: "the outputs" is suggested changing to "outputs"; line 13: "phase adders" is suggested changing to "phase adder"; line 16: "storing the sum" is suggested changing to "carrying out the sum stored"; line 17: "memory and carrying out conjugate" is suggested changing to "memory conjugate"; line 20: "angle/frequency" is suggested changing to "angle and frequency"; and line 24: "a" is suggested changing to "the".

Claim 20, line 9: "frequency signal" is suggested changing to "signal".

Claim 21, line 19: "analog/digital" is suggested changing to "digital"; line 22: "pilot" is suggested changing to "the pilot", "data" is suggested changing to "the data"; line 26: "demodulated" is suggested changing to "modulated"; line 29: "the symbol" is suggested changing to "a symbol"; line 31: "estimating the" is suggested changing to "estimating a"; and line 35: "summation" is suggested changing to "summing".

Appropriate corrections are required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 4, 8-9, & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiue et al. (US 6590872 B1) in view of Komatsu (US 5818882) and Kaku et al. (US 5550811).

Regarding **claims 1 & 8**, Except detailing out the frequency offset estimating section,

Shiue et al. discloses all subject matter claimed: a CDMA receiver and its methods for a code division multiple access system (column 1 lines 45-55, column 3 lines 50-55, lines 65-67, column 4 lines 54-60 which is not the frequency hopping SS) comprising: *a pilot symbol producing section* (510-512-522-523-300 FIG.5) which produces pilot symbols of complex vector expression (FIG.3 wherein the I path presents the real part of the complex expression, the Q path presents the imaginary of the complex expression) from a received radio frequency (RF) signal based on a first local frequency signal (533 FIG.5, wherein the RF signal is converted to IF signal) and a second local frequency signal (531 FIG.5 wherein the signal is the I/Q baseband signal fed to the correlator to despread), *a frequency offset estimating section* (524 FIG.5); and *a local signal generating section* which generates said first and second frequency signals based on said determined frequency offset (531-533 FIG.5). However Komatsu teaches a frequency offset

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estimating section with the integration section (7-8 FIG.3 & FIG.5) and Kaku et al. teaches the details of the integration section (33-34 FIG.1, column 3 line 53-column 4 line 3) of the estimating. As Shiue et al.'s CDMA data acquisition/reception (column 1 lines 10-15), at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the frequency offset detection taught by Komatsu implemented in Shiue et al.'s error estimators and the integrator taught by Kaku et al. to carry out in-phase adding operations to the pilot symbols of the complex vector expression over a predetermined interval in accordance with a predetermined pattern (33i-34i, 33q-34q FIG.1 '811), to carry out a complex adding operation of results of the in-phase adding operations (39 FIG.1 '811), and determines a frequency offset from a result of the complex adding operation (29 FIG.5 '882) .

The suggestion/motivation for doing so would have been optimized or improved signal reception and recovery/acquisition (column 4 lines 26-30 '872), reduced the quantity of computations and decrease the processing time for the computation to correct the frequency offset (Abstract '822), and provided a precision sync acquisition and tracking circuit for a multi path DS/CDMA receiver (column 1 line 65-column 2 line47 '811).

Therefore, it would have been obvious to combine Kaku et al.'s integrators (33-34 FIG.1, column 3 line 53-column 4 line 3) with Komatsu's integration section (26 FIG.5), Komatsu's frequency offset detection and cancellation circuits (FIG.5 '882) with Shiue et al.'s error estimators (524 FIG.5 '872) to obtain the invention as specified in claim 1.

Regarding **claims 2 & 9**, further Kaku et al. teaches the predetermined interval is an interval longer than one symbol period (column 3 lines 53-62, where the complex expression pilot symbols are summed over the period of m symbols where the m is the positive integer equal

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or greater than one). The combination as the rejection of claim 1 obtains the invention cited in claim 2.

Regarding **claims 4 & 11**, further Kaku et al. teaches *an in-phase adding* section and its methods (33-34 of each demodulators FIG.1 '811) which carry out the in-phase adding operations to the pilot symbols of the complex vector expression over the predetermined interval in accordance with the predetermined pattern (column 3 line 53-column 4 line 3 wherein the predetermined pattern is from the 33 integrator, and the adding operations performed in 34 moving average circuit '811); *an addition synthesizing* section and its methods which carry out the complex adding operation (39 FIG.1 '811) of the results of the in-phase adding operations; and *a frequency offset estimating* unit and its methods (27-28-29-30 FIG.5 '882, refer the rejection of claim 1) which determine the frequency offset from the result of the complex adding operation.

6. Claims 3, 5-7, 10, 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiue et al. (US 6590872 B1) in view of Komatsu (US 5818882) and Kaku et al. (US 5550811), further in view of Huang et al. (US 6266361).

Regarding **claims 3 & 10**, except explicitly specify to producing a channel count data indicative of a number of effective channels, Shiue et al. discloses all subject matter claimed: *the pilot symbol producing section* and its methods (510-512-522-523-300 FIG.5); and *the frequency offset estimating section* and its methods (524 FIG.5 wherein the summing pattern is the 33i-34i, 33q-34q FIG.1 '811 refer the rejection of claim 1). However further Huang et al. teaches a channel count data indicative of *a number of effective channels* (column 7 lines 37-50, wherein

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the p paths from the matched filter greater than the threshold is the channel count data indicative of a number of effective channels). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the channel count data indicative of a number of effective channels taught by Huang et al. in Shiue et al.'s frequency offset estimating section to correct the frequency offset of a multipath fading presented in wideband CDMA channels (column 7 lines 36-37 '361).

Regarding **claims 5 & 12**, further Kaku et al. teaches in-phase adding section includes a plurality of *in-phase adding units* (33-34 FIG.1), each of which includes: *a buffer memory* which stores the pilot symbols of the complex vector expression (column 3 line 53-column 4 line 3, where the m-stage shift register of the adding unit is the memory); and *an in-phase adder* which reads out said pilot symbols of said complex vector expression from the buffer based on over the predetermined interval and the predetermined pattern, and carries out the in-phase adding operation to the read out pilot symbols of the complex vector expression, and further Komatsu teaches a *control section* (20-21-23-24 FIG.5) which generates the predetermined interval and the predetermined pattern based on an addition count data indicative of a number of pilot symbols to be added and an in-phase summing pattern. The combination as the rejection of claim 1 obtains the invention cited in claim 5.

Regarding **claims 6 & 13**, Kaku et al. discloses a complex adder which carries out the complex adding operation of the results of the in-phase in the addition synthesizing section (39 FIG.1).

Regarding **claims 7 & 14**, inhering the limitations of claim 4 and claim 11 respectively, in the modified receiver of claims 4 and 11, further Katu discloses the frequency offset

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estimating unit includes: *a buffer memory* (33-34 FIG.1 '811) which stores the result of said complex adding operation; *a conjugate complex multiplier* (38 FIG.1 '811) which carries out a conjugate complex multiplication of the result of the complex adding operation stored in the buffer memory; further Komatsu discloses *an averaging unit* (26 FIG.5 '882, 33-34 FIG.1 '811) which carries out an averaging operation to the phase difference vectors; *an angle converter* (27 FIG.5, column 6 lines 45-55 '882) which converts the averaged phase difference vector to an angle value; *and a converter* (29 FIG.5, column 6 lines 45-55 '882) which converts the angle value to the frequency offset based on a symbol rate.

Allowable Subject Matter

7. Claims 15-21 would be allowable if rewritten to overcome the objections listed in paragraph 4 set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or suggest, alone or in a combination, among other things, at least an automatic frequency controlling system and its method as a whole, the combination of elements and features as claimed, which includes in-phase summing in at least two different in-phase summation rates as two manners the pilot symbols having a complex vector expression over a predetermined length of a symbol section or interval.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

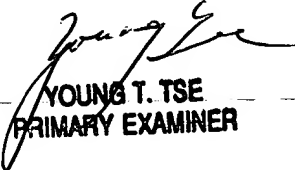
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
November 7, 2004


YOUNG T. TSE
PRIMARY EXAMINER